Remarks

In the outstanding Official Action, the Examiner:

(1) indicated Figures 1 and 2 should be designated by a legend such as -- Prior Art -- because only that which is old is illustrated;

(2) rejected claims 1-6 under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention;

(3) rejected claims 1, 2, and 5 under 35 USC 102(e) as being anticipated by Leard et al.;

(4) rejected claim 6 as being rejected by Fomenkov; and

(5) rejected claims 3 and 4 under 35 USC 103(a) as being unpatentable over Leard in view of Mooradian and further in view of Camparo et al.

In response to Item 1 above, Applicant respectfully traverses the objection to Figs. 1 and 2 that the drawings should be designated by a legend such as -- Prior Art -- because only that which is old is illustrated. Applicant believes that the subject matter illustrated in Figs. 1 and 2 is not prior art with respect to the above-identified patent application. Reconsideration is respectfully requested.

In respect to Item 2 above, Applicant has now amended claims 1-6 so as to more clearly define the present invention.

Claim 1 is now amended at line 4 to delete "the" prior to "difference" and insert -- an -- in place thereof. Claim 1 is now amended at line 5 to delete "the" prior to "instantaneous wavelength" and insert -- an -- in place thereof. Claim 1 is now amended at line 7 to delete "same" and to insert -- difference -- in place thereof. Claim 1 is now amended at line 9 to delete "the" prior to "electrooptical performance". Claim 1 is now amended at lines 9-11 to replace "the laser's gain medium" with -- a gain medium of the tunable laser --.

Claim 2 is now amended at line 4 to delete "the" prior to "injection current" and insert -- the -- in place thereof. Claim 2 is now amended at lines 4 and 6 to delete "laser's" prior to "gain medium", respectively, and at lines 5 and 6 to insert -- of the tunable laser -- subsequent to "gain medium".

Claim 3 is now amended at line 4 to delete "the" prior to "intensity" and insert -- an -- in place thereof, and to delete "the" prior to "pump laser" and insert -- a -- in place thereof. Claim 3 is now amended at lines 4 and 6 to delete "laser's" prior to "gain medium", respectively, and at lines 5-7 to insert -- of the tunable laser -- subsequent to "gain medium", respectively.

Claim 4 is now amended at line 4 to delete "the" prior to "injection current" and insert -- an -- in place thereof, and to delete "the" prior to "gain medium" and insert -- a -- in place thereof. Claim 4 is now amended at line 5 to delete "the" prior to "electrooptical performance". Claim 4 is now amended at line 6 to delete "tunable laser's" prior to "gain medium" and to insert -- of the tunable laser -- thereafter.

Claim 5 is now amended at line 7 to delete "the" prior to "instantaneous wavelength" and insert -- an -- in place thereof. Claim 5 is now amended at line 9 to delete "same" and insert -- difference -- in place thereof. Claim 5 is now amended at line 11 to delete "the" prior to "electrooptical performance". Claim 5 is now amended at lines 12 and 13 to delete the "the laser's" and insert -- a -- in place thereof and to insert -- of the tunable laser -- subsequent to "gain medium".

Claim 6 is now amended at line 3 to delete "the" prior to "difference" and insert -- a -- in place thereof, and to delete "the" prior to "instantaneous wavelength" and insert -- an -- in place thereof. Claim 6 is now amended at line 4 to delete "the" prior to "target wavelength" and insert -- a -- in place thereof. Claim 6 is now amended at lines 5 and 6 to delete "same" and insert -- difference -- in place thereof. Claim 6 is now amended

at lines 7 and 8 to delete "the" prior to "electrooptical performance", to delete "the laser's" prior to "gain medium" and insert -- a -- in place thereof, and to insert -- of the tunable laser -- subsequent to "gain medium".

Accordingly, claim 1-6 are believed to be in condition for allowance, and allowance thereof is respectfully requested.

With respect to Item 3 above, Applicant respectfully traverses the rejection of claims 1, 2 and 5 under 35 USC 102(e) as being anticipated by Leard et al.

Independent claim 1 of the present invention comprises wavelength stabilizing apparatus for use in stabilizing the wavelength of a tunable laser to a target wavelength, the wavelength stabilizing apparatus comprising a wavelength measuring module for detecting a difference between an instantaneous wavelength of the laser and the target wavelength, and for generating an output signal which is representative of the difference.

Independent claim 5 of the present invention comprises a laser system comprising a wavelength stabilizing apparatus for use in stabilizing the wavelength of the tunable laser to a tunable wavelength, the wavelength stabilizing apparatus comprising a wavelength measuring mode for detecting the

difference between an instantaneous wavelength of the laser and the target wavelength, and for generating an output signal which is representative of the difference.

Applicant believes that Leard et al. disclose a laser diode communication device having a laser diode; two detectors; wavelength and power error signal circuitry, which generates a wavelength error signal based on the difference between the two detectors and also generates a power error signal based on the combined responses of the detectors; an injection current controller, which receives the power error signal so as to modulate the injection current of the laser diode both to encode an information signal and to maintain nominal, predetermined output optical powers so as to conform to the laser diode communication device's damage thresholds and user design specifications; and temperature control circuitry, which receives the wavelength error signal from the wavelength and power error signal circuitry so as to maintain a constant controlled operating temperature and, thus, stable wavelength for the optical signal.

Applicant believes that Leard et al. does not disclose a wavelength measuring module for detecting the difference between an instantaneous wavelength of the laser and the target

wavelength, and for generating an output signal which is representative of the difference. Leard et al. is believed to teach away from the present invention in that (1) the wavelength error signal is sent to the temperature control circuitry to stabilize the wavelength of the laser diode, (2) the power error signal is generated based on the difference between the response of the two detectors rather than the difference between the instantaneous wavelength of the laser and the target wavelength, and (3) the power error signal is used to modulate the injection current of the laser diode by the controller to maintain predetermined output optical powers so as to conform with both damage thresholds and user design specifications rather than modifying the electrooptical performance of the gain medium so as lock the tunable laser to its target frequency.

Accordingly, independent claims 1 and 5 are believed to be in condition for allowance, and allowance thereof is respectfully requested.

Claim 2, which is directly dependent from claim 1, is believed to be in condition for allowance for at least the above-identified reasons. Accordingly, allowance thereof is respectfully requested.

In response to Item 4 above, Applicant respectfully traverses the rejection of claim 6 under 35 USC 102(b) as being anticipated by Fomenkov.

Claim 6 of the present invention comprises a method for stabilizing the wavelength of a tunable laser to a target frequency, the method comprising modifying the electrooptical performance of a gain medium of the tunable laser in accordance with the output signal so as to lock the tunable laser to its target frequency.

Applicant believes that Fomenkov does not teach the above-identified wavelength stabilization method of the present invention, which comprises modifying the electrooptical performance of the gain medium of the tunable laser. Fomenkov is believed to disclose a wavelength adjustment mechanism that is controlled by a wavemeter such that a corrective signal is sent via a path to the wavelength adjustment mechanism so as to correct the error between a detected wavelength and a desired wavelength. However, Fomenkov is silent as to how his wavelength adjustment mechanism adjusts the wavelength of the laser. Accordingly, claim 6 is believed to be in condition for allowance, and allowance thereof is respectfully requested.

In response to Item 5 above, Applicant respectfully traverses the rejection of claims 3 and 4 under 35 USC 103(a) as being unpatentable over Leard et al. in view of Mooradian and in further view of Camparo et al. As noted above, Leard et al. fail to teach the wavelength measuring module of the present invention. Mooradian and Comparo et al. fail to supply this missing teaching. Inasmuch as claims 3 and 4 depend either directly or ultimately from independent claim 1, claims 3 and 4 are believed to be allowable for the above-identified reasons. Accordingly, allowance of claims 3 and 4 is respectfully requested.

On account of the foregoing, claims 1-6 are believed to be in condition for allowance. Early and favorable reconsideration is therefore respectfully solicited.

Respectfully submitted,

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December 9, 2002
(DATE OF DEPOSIT)

James A. Sheridan
(NAME OF ATTORNEY)

James A. Sheridan 12/9/02
(SIGNATURE)

December 9, 2002
(DATE OF SIGNATURE)

Version With Markings To Show Changes Made

1. (Amended) Wavelength stabilizing apparatus for use in stabilizing the wavelength of a tunable laser to a target wavelength, the wavelength stabilizing apparatus comprising:

a wavelength measuring module for detecting [the] a difference between [the] an instantaneous wavelength of the laser and the target wavelength, and for generating an output signal which is representative of the [same] difference; and

a control unit for receiving said output signal from said wavelength measuring module and for modifying [the] electrooptical performance of [the laser's gain medium] a gain medium of the tunable laser in accordance with said output signal so as to lock the tunable laser to its target frequency.

2. (Amended) Wavelength stabilizing apparatus according to claim 1 wherein the tunable laser is an electrically pumped laser, and further wherein said control unit is adapted to adjust [the] an injection current applied to the [laser's] gain medium of the tunable laser so as to modify the electrooptical performance of the [laser's] gain medium of the tunable laser.

3. (Amended) Wavelength stabilizing apparatus according to claim 1 wherein said tunable laser is an optically pumped laser, and further wherein said control unit is adapted to adjust [the] intensity of [the] a pump laser applied to the [laser's] gain medium of the tunable laser so as to modify the electrooptical performance of the [laser's] gain medium of the tunable laser.

4. (Amended) Wavelength stabilizing apparatus according to claim 3 wherein the pump laser is an electrically pumped laser, and further wherein said control unit is adapted to adjust [the] an injection current applied to [the] a gain medium of the pump laser so as to modify [the] electrooptical performance of the [tunable laser's] gain medium of the tunable laser.

5. (Amended) A laser system comprising:

a tunable laser; and

wavelength stabilizing apparatus for use in stabilizing the wavelength of said tunable laser to a target wavelength, said wavelength stabilizing apparatus comprising:

a wavelength measuring module for detecting the difference between [the] an instantaneous wavelength of the laser and the target wavelength, and for generating an output signal which is representative of the [same] difference; and

a control unit for receiving said output signal from said wavelength measuring module and for modifying [the] electrooptical performance of [the laser's] a gain medium of the tunable laser in accordance with said output signal so as to lock the tunable laser to its target frequency.

6. (Amended) A method for stabilizing the wavelength of a tunable laser to a target frequency, said method comprising:

detecting [the] a difference between [the] an instantaneous wavelength of the laser and [the] a target wavelength, and generating an output signal which is representative of the [same] difference; and

modifying [the] electrooptical performance of [the laser's] a gain medium of the tunable laser in accordance with said output signal so as to lock the tunable laser to its target frequency.